Instruction Manual

JOHN FLUKE MFG. CO., INC.

FLUKE

ELECTRONICS FOR INDUSTRY

INSTRUMENTS / COMPONENTS

Preliminary Operating Instructions
for
MODEL 881A & 881AB
ALL SOLID-STATE
DC DIFFERENTIAL VOLTMETER

Serial No. 123 and above

ADDENDUM

FLUKE MODEL 885A & 885AB

This manual is intended for use with the 881A and 881AB Differential Voltmeters. The 885A and 885AB, however, are similar to the 881A and 881AB. This manual is for use as an interim measure while the final instruction manual is being prepared. When completed, the final instruction manual will be shipped to you at no charge provided that the no postage reply card is filled out and returned to FLUKE to ensure proper delivery.

Although the circuit of the 885A and 885AB are essentially the same as for the 881A and 881AB, many special components and construction techniques have been used to improve the accuracy. Therefore, the specification listed in this manual apply to the 885A and 885AB except as follows:

DC ACCURACY: ±(0.005% of input voltage +5 uv) from 0 to 1100 VDC.

KELVIN-VARLEY ACCURACY: ±0.001% of output from 1/11 of full scale to full scale.

OPERATING TEMPERATURE RANGE: Within specifications from 65°F to 85°F.

The schematic at the end of this manual is for the 885A and 885AB.

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TABLE OF CONTENTS

Section	Title	Page
I	SPECIFICATIONS	1-1
II	OPERATING INSTRUCTIONS	2-1
	2-1. Preliminary Operation for Model 881A .	2-1
	2-2. Preliminary Operation for Model 881AB	2-1
	2-3. Battery Charging	2-2
	2-4. Zeroing Instructions	2-2
	2-6. Operation as a Differential Voltmeter . .	2-2
	2-7. Operation as a Conventional Voltmeter . .	2-3
	2-9. Measurement of Voltage Excursions about a Nominal Value	2-3
III	CALIBRATION	3-1
	3-1. General	3-1
	3-4. Preliminary Calibration	3-2
	3-5. Null Detector Calibration	3-2
	3-6. Kelvin-Varley Input Voltage Calibration .	3-3
	3-7. Input Divider Calibration	3-3

SECTION I

SPECIFICATIONS

AS A DIFFERENTIAL VOLTMETER

DC ACCURACY: ±(0.01% of input voltage + 5 uv) from 0 to 1100 VDC.

AC ACCURACY:

20 cps to 5 KC
±(0.1% of input + 25 uv) from 0.001 to 1100V

5 KC to 10 KC
±(0.15% of input + 25 uv) from 0.001 to 1100V

10 KC to 20 KC
±0.3% of input from 0.1 to 1100V

20 KC to 100 KC
±1% of input from 0.1 to 110V

10 cps to 20 cps
±(0.3% of input + 25 uv) from 0.001 to 1100

5 cps to 10 cps
±(1% of input + 25 uv) from 0.001 to 1100

VOLTAGE RANGES: 1, 10, 100, 1000V AC and DC, with 10% overvoltage capability on each range.

NULL RANGES: 100 uv through 100V AC and DC, in seven ranges.

DC INPUT RESISTANCE: Infinite at null from 0 to 11 VDC: 10 megohms above 11 VDC.

AC INPUT IMPEDANCE: 1 megohm, 40 uuf.

METER RESOLUTION: 1 uv maximum.

VOLTAGE DIAL RESOLUTION: 1 uv maximum.

POLARITY: Front panel switch selects +DC, -DC, and AC.

OFF NULL METER ACCURACY: ±5%

AS A CONVENTIONAL VOLTMETER

ACCURACY: 3% of range.

RANGE:

Voltage Range	DC Input Resistance	AC Input Impedance
1000-0-1000	10 Meg	1 Meg, 40 uuf
100-0-100	"	"
10-0-10	"	"
1-0-1	"	"
*0.1-0-0.1	"	"
*0.01-0-0.01	"	"
*0.001-0-0.001	1 Meg	"
*0.0001-0-0.0001	"	"

NOTE: 10 % overvoltage capability on each range.
*These ranges obtained by using null ranges with all five voltage readout dials set to zero.

GENERAL

ELECTRICAL DESIGN: Completely solid-state.

INPUT RESISTANCE OF NULL DETECTOR: 10 megohms for two highest null ranges, all input ranges; 1 megohm for two lowest null ranges, all input ranges.

REFERENCE ELEMENT: Temperature-compensated zener diode.

OPERATING TEMPERATURE RANGE: Within specifications from $55^{\circ}F$ to $95^{\circ}F$.

STORAGE TEMPERATURE RANGE: $40^{\circ}F$ to + $170^{\circ}F$.

KELVIN-VARLEY ACCURACY: ±0.002% of output from 1/11 of full scale to full scale.

RECORDED OUTPUT: Adjustable from 0 to ±20 mv minimum for full scale right and left deflections.

REGULATION OF REFERENCE SUPPLY: 0.0005% for a 10% voltage change.

SECTION II

OPERATING INSTRUCTIONS

2-1. PRELIMINARY OPERATION FOR MODEL 881A

a. Connect power plug to a 115 volt AC power source. If instrument has been wired for 230 volt operation, connect to 230 volts AC.

> NOTE: The round pin on polarized three-prong plug connects instrument case to power system ground. Use three-to-two pin adapter supplied with instrument when connecting to a two-contact receptacle. For personnel safety, connect short green lead to a good earth ground.

b. Set controls on 881A voltmeter as follows:

RANGE	1000
NULL	TVM
polarity	+ (positive)
all voltage readout dials	0 (zero)

2-2. PRELIMINARY OPERATION FOR MODEL 881AB

a. For line operation, connect power plug to a 115 volt AC power source. If instrument has been wired for 230 volt operation, connect to 230 volts AC.

> NOTE: The round pin on polarized three-prong plug connects instrument case to power system ground. Use three-to two pin adapter supplied with instrument when connecting to a two-contact receptacle. For personnel safety, connect short green lead to a good earth ground.

b. For line operation, set POWER switch to LINE OPR.

c. For battery operation, set POWER switch to BAT CHECK and wait for 10 seconds. Meter needle should indicate in BATTERY OK region. If not, charge batteries as outlined in paragraph 2-3. If batteries are charged, set POWER switch to BAT OPR-LINE ISOL.

d. Set controls on voltmeter as follows:

RANGE	1000
NULL	TVM
polarity	+ (positive)
all voltage readout dials	0 (zero)

2-3. BATTERY CHARGING

a. Connect power plug to a 115 volt AC power outlet. If instrument has been wired for 230 volt operation, connect to 230 volts AC.

b. Set POWER switch to BAT CHG-LINE OPR. After 16 hours, batteries will be fully charged and capable of operationg the instrument for at least 30 hours. While the bateries are being charged, the instrument may be operated the same as for line operation.

> CAUTION: Since overcharging decreases battery life, it is recommended that the batteries be charged for less than 48 hours and never more than 1 week. When used properly, the batteries will give more than 200 charge-discharge cycles of operation.

2-4. ZEROING INSTRUCTIONS

2-5. From time to time, it may be necessary to adjust the internal meter zero control. This will normally be done at somewhat more frequent intervals than complete instrument calibration. Proceed as follows:

a. Perform preliminary operation as stated in paragraph 2-1 or 2-2.

b. Mechanically zero the meter with the adjustment screw on the front of the meter case. If the instrument is in the case, it must be shut off for at least three minutes prior to this adjustment. If out of case, another method would be to short out the internal meter terminals prior to zeroing.

c. Set power switch to ON and allow a 5 minute warmup period.

d. Set RANGE switch to 1, voltage readout dials to zero, and NULL switch to 0.0001.

e. Adjust electronic ZERO control with a screwdriver for zero meter deflection.

2-6. OPERATION AS A DIFFERENTIAL VOLTMETER

a. Perform preliminary operation as stated in paragraph 2-1 or 2-2.

b. Connect unknown voltage between INPUT and COMMON posts. If one side is grounded, always connect it to the COMMON post.

c. Turn RANGE switch to lowest range that will allow an on-scale reading and note approximate value of unknown voltage as indicated on meter scale.

d. If meter reads to left, turn polarity switch to negative position. Meter needle will deflect to right. This is because polarity of unknown voltage is negative.

e. Noting the position of decimal point, set five voltage readout dials to approximate voltage determined in step b. For example, if approximate voltage is 35 volts, the decimal point will be between the B and C voltage readout dials. Therefore, set A dial to 3 and B dial to 5.

f. Set NULL switch to successively more sensitive null ranges and adjust voltage readout dials for zero meter deflection in each null position. When meter needle indicates to right, magnitude of voltage under measurement is greater than voltage set on voltage readout dials. When indication is to the left, voltage is less than that set on readout dials.

g. Read unknown voltage directly from the five voltage readout dials.

2-7. OPERATION AS A CONVENTIONAL VOLTMETER

2-8. If it is desired to use the instrument as a conventional 3% voltmeter only, additional ranges can be made available by converting the NULL ranges to conventional voltmeter ranges. This is made possible be setting the voltage readout dials to zero. Proceed as follows:

a. Perform preliminary operation as stated in paragraph 2-1 or 2-2.

b. Consult figure 2-1, and select full scale voltage deflection desired. If approximate value of voltage to be measured is unknown, select 1000 volt range initially.

c. Set RANGE switch, NULL switch, and voltage dials as indicated for the range selected.

d. Connect voltage to be measured between INPUT and COMMON posts. If one side is grounded, always connect it to the COMMON post.

e. Read voltage from meter scale. Deflection to the right indicates that unknown DC voltage is of positive polarity.

FULL-SCALE DEFLECTION	RANGE SWITCH	NULL SWITCH	VOLTAGE DIALS
1000-0-1000	1000	TVM	No effect
100-0-100	100	TVM	No effect
10-0-10	10	TVM	No effect
1-0-1	1	TVM	No effect
0.1-0-0.1	1	0.1	All zero
0.01-0-0.01	1	0.01	All zero
0.001-0-0.001	1	0.001	All zero
0.0001-0-0.0001	1	0.0001	All zero

Figure 2-1. VTVM RANGES

2-9. MEASUREMENT OF VOLTAGE EXCURSIONS ABOUT A NOMINAL VALUE

a. Perform preliminary operation as stated in paragraph 2-1 or 2-2.

b. Connect voltage to be observed between INPUT and COMMON posts. If one side is grounded, always connect it to COMMON post. Deflection to the left indicates voltage being measured is negative; set polarity switch to negative position in this case. This will cause meter needle to deflect to the right.

c. Set RANGE switch to lowest range which will give an on-scale meter indication and note nominal value of voltage indicated.

d. Set the five voltage readout dials to nominal voltage.

e. Turn NULL switch to lowest position that will allow voltage excursions to remain on scale.

f. Read voltage excursions from meter. Note that full scale right and left meter deflections are equal to the NULL range setting (desregarding 10% over-range at end of scale). Meter deflection to the right indicates that the voltage under observation has increased above the nominal value while deflection to the left indicates it has decreased.

SECTION III

CALIBRATION

3-1. GENERAL

3-2. The 881A and 881AB should be calibrated as often as deemed necessary. However, it is recommended that the instrument be calibrated every six months under ordinary laboratory conditions For special applications where extreme accuracy is required, it may be desired to calibrate the instrument more frequently. Calibration should be accomplished under typical laboratory operating conditions in a draft free area with an ambient temperature of 72.5 (±2.5)°F for maximum accuracy.

3-3. For convenience, the calibration procedure is divided into four parts: Preliminary Calibration, Null Detector Calibration, Kelvin-Varley Input Voltage Calibration, and Input Divider Calibration. Calibration is normally done by performing all four parts in the sequence given here However, the calibration procedure is written so that any section of the instrument may be calibrated by performing the calibration procedure for that section after performing the preliminary calibration procedure. The recommended equipment and the specifications required for calibration are shown in figure 3-1.

RECOMMENDED EQUIPMENT	SPECIFICATIONS REQUIRED
Fluke 301C or 301E Power Supply Saturated standard cell bank with an accuracy of ±0.0005% Voltage reference divider having division ratios of 1, 10, and 100 with an accuracy of ±0.001% Galvanometer suitable for use with above voltage reference divider	The equipment used must provide 100, 10, and 1 volt with an accuracy of ±(0.0015% + 2 uv)

Figure 3-1. CALIBRATION EQUIPMENT

3-4. PRELIMINARY CALIBRATION

a. Set meter to zero with mechanical zero control.
b. Set controls on 881 as follows:

RANGE	10
NULL	0.001
polarity	+
all voltage readout dials	0 (zero)

c. Set POWER switch to ON and allow 881 to warmup to equilibrium temperature (about 10 minutes).
d. Set up the necessary equipment to provide DC voltages of 100, 10, and 1 volts with an accuracy of ±(0.0015% + 2 uv) Proceed as follows: turn on all test equipment and allow it to warmup to equilibrium temperature (about 1/2 hour); connect galvanometer and standard cell bank in series to standard cell terminals of divider; set proper standard cell voltage on divider; apply 100 volts DC into 100 volt input terminal of divider; zero galvanometer by varying output of power supply; voltages of 100, 10, and 1 volts DC ±(0.0015% + 2 uv) are available at the corresponding output terminals.
e. Connect CHASSIS ground post to line ground.

3-5. NULL DETECTOR CALIBRATION.

a. Short INPUT post to COMMON post and null meter be adjusting electronic ZERO control (R239).
b. Set controls on 881 as follows:

RANGE	1
NULL	0.1
voltage read-out dial A	1

c. Adjust R230 for full scale deflection to the left
d. Set controls on 881 as follows:

RANGE	1
NULL	0.0001
all voltage readout dials	0 (zero)

e. Null meter by adjusting electronic ZERO control (R239)
f. Set voltage readout dial D to 1 and adjust R231 for full scale deflection to the left
g. Remove short from between INPUT and COMMON posts

3-6. KELVIN-VARLEY INPUT VOLTAGE CALIBRATION

a. Set controls on 881 as follows:

RANGE	10
NULL	1.0
voltage readout dials	10.00000

b. Apply 10 volts DC ±(0.0015% + 2 uv) between INPUT and COMMON posts.
c. Adjust R119 for a zero meter deflection in each successively more sensitive null range.
d. Set controls on 881 as follows:

RANGE	1
NULL	0.1
voltage readout dials	1.000000

e. Apply 1 volt DC ±(0.0015% + 2 uv) between INPUT and COMMON posts.
f. Adjust R121 for zero meter deflection in each successively more sensitive null range.

3-7. INPUT DIVIDER CALIBRATION

a. Set controls on 881 as follows:

RANGE	100
NULL	10
voltage readout dials	100.0000

b. Apply 100 volts DC ±(0.0015% + 2 uv) between INPUT and COMMON posts.
c. Adjust R103 for zero meter deflection in each successively more sensitive null range.

WARRANTY

The JOHN FLUKE MFG. CO., INC. warrants each instrument manufactured by them to be free from defects in material and workmanship. Their obligation under this Warranty is limited to servicing or adjusting an instrument returned to the factory for that purpose, and to making good at the factory any part or parts thereof; except tubes, fuses, choppers and batteries, which shall, within one year after making delivery to the original purchaser, be returned by the original purchaser with transportation charges prepaid, and which upon their examination shall disclose to their satisfaction to have been thus defective. If the fault has been caused by misuse or abnormal conditions of operation, repairs will be billed at a nominal cost. In this case, an estimate will be submitted before work is started, if requested.

If any fault develops, the following steps should be taken.

1. Notify the John Fluke Mfg. Co., Inc., giving full details of the difficulty, and include the Model number, type number, and serial number. On receipt of this information, service data or shipping instructions will be forwarded to you.

2. On receipt of the shipping instructions, forward the instrument prepaid, and repairs will be made at the factory. If requested, an estimate of the charges will be made before the work begins, provided the instrument is not covered by the Warranty.

SHIPPING

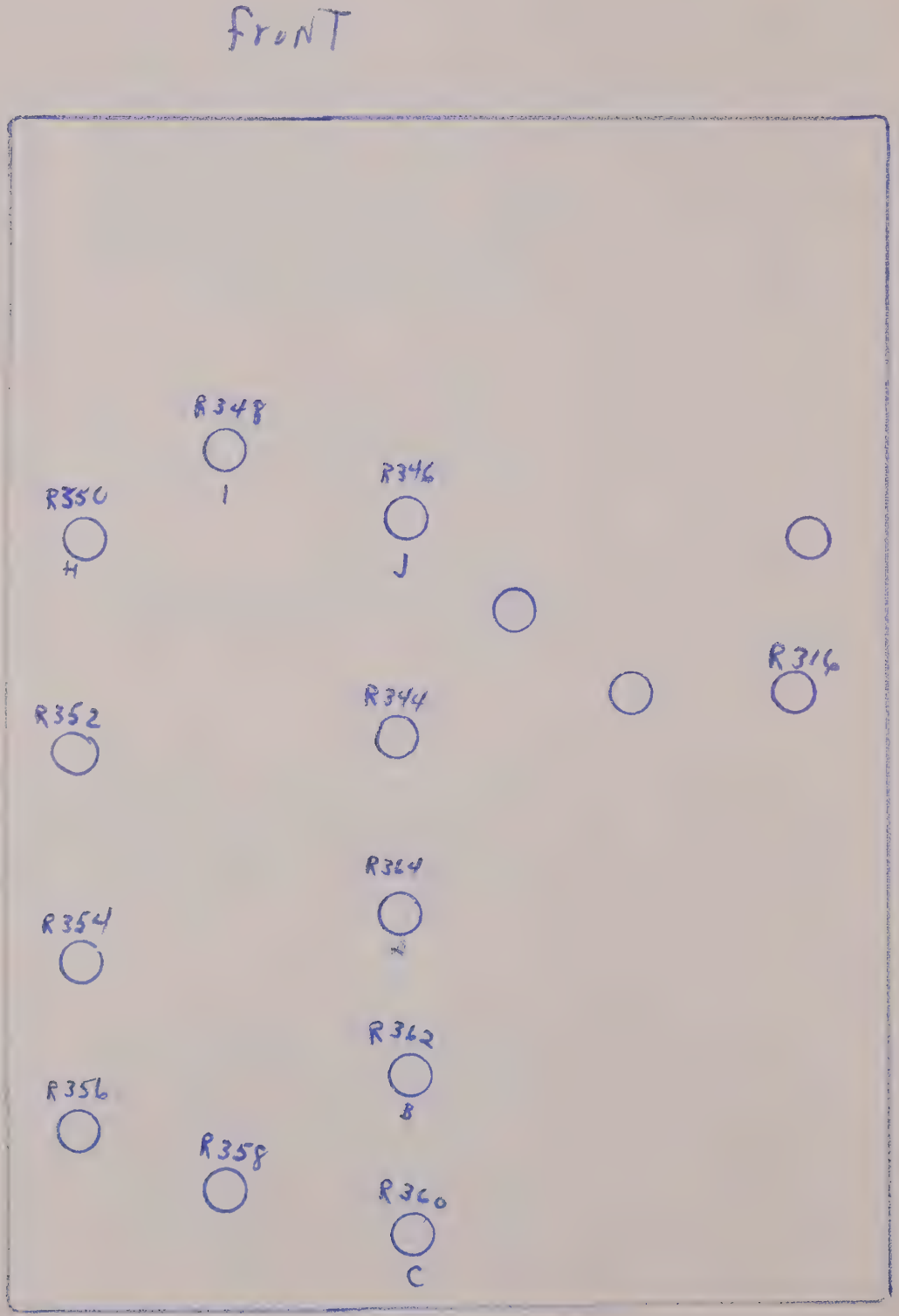
All shipments of John Fluke Mfg. Co., Inc. instruments should be made via Railway Express prepaid. The instrument should be shipped in the original packing carton; or if it is not available, use any suitable container that is rigid. If a substitute container is used, the instrument should be wrapped in paper and surrounded with at least four inches of excelsior or similar shock-absorbing material.

CLAIM FOR DAMAGE IN SHIPMENT

The instrument should be thoroughly inspected immediately upon receipt. All material in the container should be checked against the enclosed packing list. The manufacturer will not be responsible for shortages against the packing sheet unless notified immediately. If the instrument fails to operate properly, or is damaged in any way, a claim should be filed with the carrier. A full report of the damage should be obtained by the claim agent, and this report should be forwarded to John Fluke Mfg. Co., Inc. Upon receipt of this report you will be advised of the disposition of the equipment for repair or replacement. Include the model number, type number, and serial number when referring to this instrument for any reason.

The John Fluke Mfg. Co., Inc. will be happy to answer all application questions which will enhance your use of this instrument. Please address your requests to:

JOHN FLUKE MFG. CO., INC., P. O. BOX 7428, SEATTLE 33, WASHINGTON


FRONT
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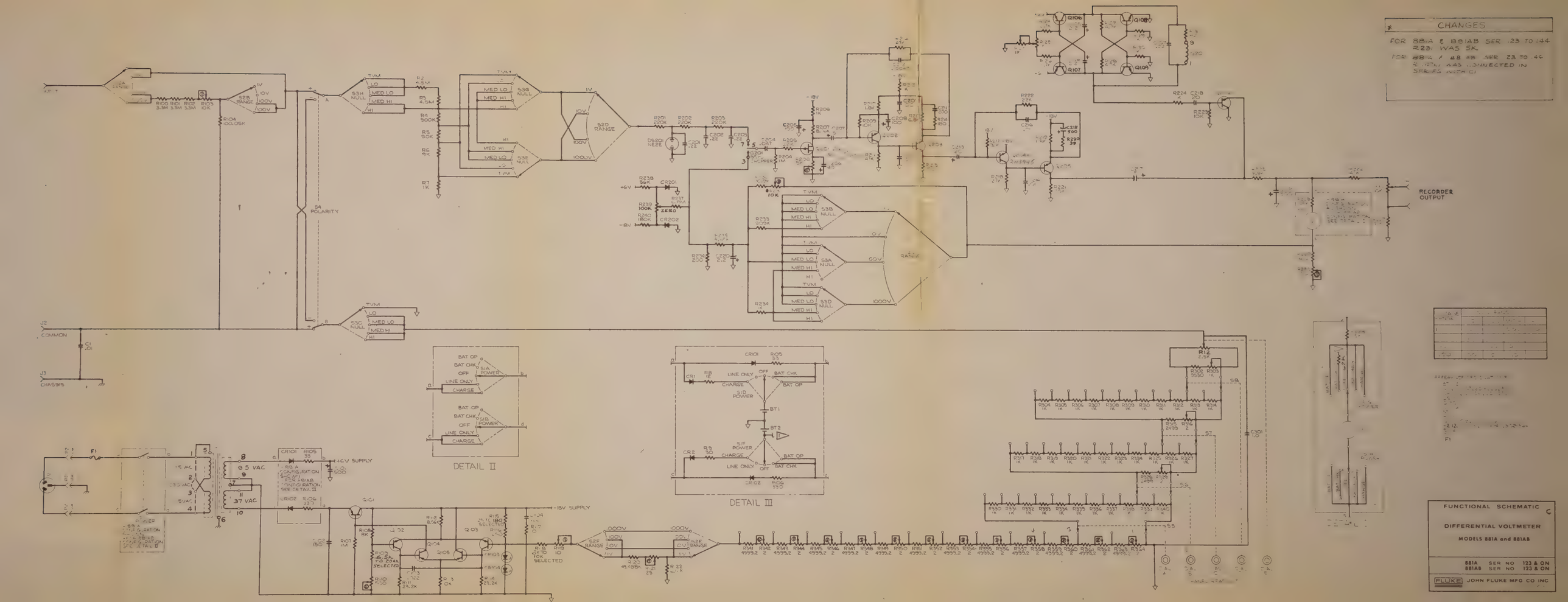

CHANGES
FOR 881A & 881AB SER 123 TO 144
R231 WAS 5K
FOR 881A & 881AB SER 23 TO 46
R1001 WAS CONNECTED IN
SHARED WITH C1
S4 POLARITY
S2B RANGE
S2D RANGE
S2E RANGE
S2F RANGE
S3H NULL
S3G NULL
S3E NULL
S3C NULL
S3B NULL
S3A NULL
S3D NULL
T.V.M.
LO
MED LO
MED HI
HI
RECORDER OUTPUT
COMMON
CHASSIS
DETAIL II
DETAIL III
BAT OP
BAT CHK
OFF
LINE ONLY
CHARGE
+16V SUPPLY
-18V SUPPLY
115 VAC
230 VAC
5 VAC
6.5 VAC
37 VAC
FUNCTIONAL SCHEMATIC
DIFFERENTIAL VOLTMETER
MODELS 881A and 881AB
881A SER NO 123 & ON
881AB SER NO 123 & ON
FLUKE JOHN FLUKE MFG CO INC

1965 CATALOG

TEST · MEASURE · CALIBRATE

FLUKE

INSTRUMENTATION

FLUKE

Contents

	Page
Current Shunts	8
Electronic Galvanometers	6
Impedance Bridge	7
Isolation Amplifier	2
Microvolt Potentiometer	6
Power Supplies	
Constant Current	12
General Purpose	12
High Voltage	10
Thermal Converters	8
Thermal Transfer Standard	8
VAW Meter	7
Voltage Calibrators	9
Voltage Dividers	6
Voltmeters	
Solid-State, AC/DC Differential	2
Solid-State, DC Differential	3
AC/DC Differential	4
DC Differential	5
True RMS	7
Militarized	5

General Information

ADDITIONAL DATA

Of necessity, information and specifications contained in this catalog are abbreviated. Detailed technical data sheets will be furnished immediately upon request from the Fluke engineering representative in your area (see inside back cover), or directly from the factory.

TECHNICAL ASSISTANCE

Demonstration of a particular instrument may be conveniently arranged with the local Fluke representative. Technical assistance in selecting equipment and preparing orders is available from engineering personnel at these local offices, supplemented by a highly qualified staff of applications engineers at the factory.

ORDER BY MODEL NUMBER

When ordering, please specify the complete instrument model number and nomenclature. For example, "Model 803B AC/DC Differential Voltmeter." Note that suffix letter "R" after a model number designates rack mounting version of those instruments available in either a rack or bench mounting configuration. Many Fluke instruments use one configuration for both bench and rack mounting.

SPECIAL INSTRUMENT SERVICE

Many Fluke instruments can be supplied with non-standard paint, altered specification ranges, special connectors, or other special features. Please consult the authorized Fluke representative in your area or the factory Special-Instrument Service for prices, delivery schedules, and special ordering information.

WHERE TO SEND YOUR ORDER

Orders should be made out to John Fluke Mfg. Co., Inc., sent in care of your local Fluke representative (see inside back cover), or directly to P.O. Box 7428, Seattle, Wash. 98133.

SHIPPING METHODS

Shipments are made directly from the factory. Unless specifically requested otherwise, express or truck transportation is used, whichever is least expensive and most serviceable to you. Small items may be sent via parcel post. Air freight, air express, or air parcel post will be used when specified on your order.

TERMS

U.S. and Canada terms are 30 days net. Unless credit has already been established, shipments will be made C.O.D., or on receipt of cash in advance. Terms for orders from other countries are irrevocable letter of credit or cash in advance unless other terms have been previously arranged.

PRICES

Prices are F.O.B. factory, Mountlake Terrace, Washington, unless otherwise specified. All prices are in U.S. funds and are subject to change without notice.

QUOTATIONS AND PRO FORMA INVOICES

Upon request, quotations or pro forma invoices will be furnished to you by your local Fluke sales representative or the John Fluke Mfg. Co., Inc.

SERVICE

Complete facilities are maintained at the factory to repair and recalibrate any Fluke instrument. In most instances, prompt service and parts replacement can also be made by the authorized Fluke sales representative in your area.

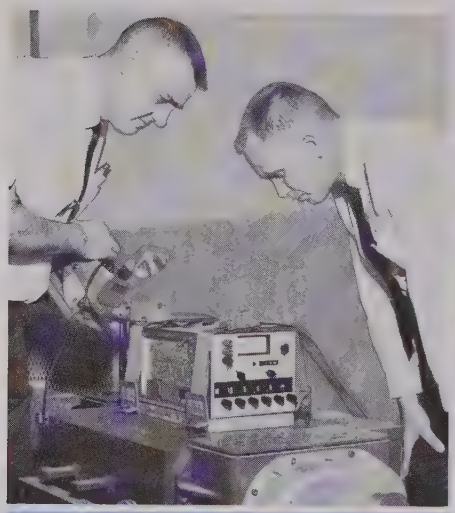
When you wish to return an instrument to the factory for repairs, recalibration, or for any other reason, please contact Customer Service, John Fluke Mfg. Co., Inc., P.O. Box 7428, Seattle, Washington 98133, for instructions before shipment. Please give model number, name, serial number and as much information as possible concerning the reason for return. Non-warranty repairs are made at the cost of labor and materials, plus a small service charge. An estimate will be submitted, if requested, before work is started.

PARTS

Most replacement parts may be ordered from your local Fluke representative. Please identify parts by Fluke stock number and part description as shown in the instruction manual, and if possible, by the schematic diagram circuit reference number. Model number and serial number of the instrument and original purchase date should also be given.

WARRANTY

All Fluke instruments are warranted against defective materials and workmanship for one year. All power transformers are warranted for the life of the instrument. Tubes and lamps are considered expendable components and are warranted for 90 days.



JOHN FLUKE MANUFACTURING CO., INC.

FLUKE

MIL-T-945A vibration test is applied to solid-state voltmeter (top). Fluke management appraises test results (right).

Standards Lab Performance with Environmental Durability

Since 1949, John Fluke Mfg. Co. electronic test and measuring equipment has set the pace for extending standards laboratory accuracy and stability to production line, field, and portable applications. Transferring state-of-the-art capabilities from the equipment of an air-conditioned standards laboratory to versatile, durable Fluke equipment has been accomplished in large part by devoting attention to environmental extremes of temperature, humidity, shock, and vibration.

Each new Fluke instrument design must successfully withstand the 400 pound hammer blows of MIL-T-945A as a routine minimum. Fluke temperature and humidity test chambers are used to evaluate operation over a 0°C to 50°C temperature range as a standard specification for new instrument design. In many instances, derating factors are applied outside of this range to even greater extremes. Storage temperature is determined and specified for each instrument, and is normally more than twice the operating range.

Prevention of electrical leakage due to high humidity conditions, and consequent deterioration of accuracy and other specifications, must be accomplished by careful electrical and mechanical design. All Fluke instruments specified to operate at 80% relative humidity are extensively evaluated well in excess of that amount. Differential voltmeters, when installed in an optional military combination case, have proven to withstand 100% relative humidity conditions, both operating and non-operating.

Equipment of the Fluke environmental test laboratory includes a heavy duty vibration table. MIL-T-945A vibration specifications are used as minimum standards for all instruments. (Illustrated in photo top left.)

Due to exhaustive environmental testing, individual electrical and mechanical component part deficiencies are detected, isolated, and corrected long before any Fluke instrument goes into production. To analyze defects and seek better components, Fluke maintains a Component Evaluation Group. This group also maintains close liaison with vendors for continual improvement of component quality. Very often, detailed data supplied by the Component Evaluation Group is used by vendors to immediately improve the quality of products supplied to Fluke.

Many of the outstanding specifications of Fluke instruments are dependent upon excellent accuracy, stability, and temperature coefficient parameters of resistive components. Virtually all precision wirewound resistors used in Fluke instruments are manufactured in-plant. Other components, including power transformers, are Fluke-manufactured for highest possible quality. Standard mechanical configuration for Fluke instruments includes the use of durable, MIL-P-13949 fiberglass-epoxy printed circuit boards for component mounting, with soldering accomplished by a unique Fluke automatic flow-solder process.

Upon completion of the design package, all instruments are scheduled for a pilot run and preproduction run prior to full production, with assembly accomplished on Fluke's conveyorized production line. This assures ultimate customers of Fluke products that they will receive reliable, proven instruments that are oustanding in the field of electronic test and measuring equipment.

NEW ALL-SOLID-STATE

FLUKE

AC/DC Differential Voltmeters

Fluke solid-state differential voltmeters operate from either internal, rechargeable battery pack (30 hours on full charge) or 50-440 cps line power. Battery power is ideal for measurements where maximum accuracy demands complete line isolation. Input ranges are 1, 10, 100, and 1000 volts, each with 10% overranging. The 880 series features a 100 uv full scale null range, and six-digit in-line readout obtained by four decade switches plus high-resolution interpolating vernier. The 870 series has 1 mv full scale null sensitivity and five-digit in-line readout using three decades and interpolating vernier. Decimal point placement is automatic according to range for all models.

These instruments are electrically and mechanically designed to withstand severe extremes of temperature, humidity, shock, and vibration. Fluke processes each zener diode reference to establish excellent stability and temperature coefficient parameters and manufactures all of the precision wirewound resistors used. The new solid-states are lightweight for portability and include fold-back tilting bail for operator convenience. Recorder output is a feature common to all Fluke differential voltmeters.

Model 873A

INPUT VOLTAGE:
0 to 1100V AC or DC in four ranges

ACCURACY (% OF INPUT):
DC: ±(0.03% +10 uv)
AC: 20 cps to 10 KC, 0.001 to 1100V ±(0.2% +25 uv)
AC: 10 KC to 20 KC, 0.1 to 1100V, ±0.3%
Reduced accuracy to 5 cps and 100 KC

NULL RANGES:
1 mv through 100V full scale in six ranges

INPUT IMPEDANCE:
DC: Infinite at null from 0 to 11V DC
10 megohms above 11V DC
AC: 1 megohm, 40 uuf

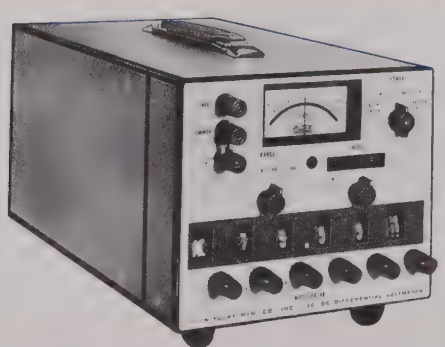
RESOLUTION:
10 uv maximum, vernier and meter

POWER:
Model 873A — 115/230 VAC, 50-440 cps
Model 873AB — As above, plus internal rechargeable battery pack

DIMENSIONS:
7" high x 8½" wide x 11¾" deep

WEIGHT:
Model 873A — Approximately 12 pounds
Model 873AB — Approximately 13 pounds

PRICE:
Model 873A — $875.00
Model 873AB — $1035.00



Model 883A

INPUT VOLTAGE:
0 to 1100V AC or DC in four ranges

ACCURACY (% OF INPUT):
DC: ±(0.01% +5 uv)
AC: 20 cps to 5 KC, 0.001 to 1100V ±(0.1% +25 uv)
AC: 5 KC to 10 KC, 0.001 to 1100V ±(0.15% +25 uv)
Reduced accuracy to 5 cps and 100 KC

NULL RANGES:
100 uv through 100V full scale in seven ranges

INPUT IMPEDANCE:
DC: Infinite at null from 0 to 11V DC
10 megohms above 11V DC
AC: 1 megohm, 40 uuf

RESOLUTION:
1 uv maximum, vernier and meter

POWER:
Model 883A — 115/230 VAC, 50-440 cps
Model 883AB — As above, plus internal rechargeable battery pack

DIMENSIONS:
7" high x 8½" wide x 14¾" deep

WEIGHT:
Model 883A — Approximately 13 pounds
Model 883AB — Approximately 14 pounds

PRICE:
Model 883A — $1215.00
Model 883AB — $1375.00

Model A88 Isolation Amplifier

The all-solid-state Model A88 Isolation Amplifier is designed to provide isolation between voltmeter and recorder—eliminating the necessity of using a recorder with input terminals isolated from ground. Thus, virtually all potentiometric recorders and many inexpensive galvanometer-type recorders can be used with the aid of the A88. Model A88 is also excellent for performing accurate DC microvolt and nanoampere measurements in the presence of common mode voltages up to 1100V DC and 3V AC, 50 to 500 cycles.

INPUT CURRENT RANGE:
0 to ±2 microamperes

OUTPUT VOLTAGE RANGE:
0 to ±2 volts

MAXIMUM OUTPUT CURRENT:
1 milliampere

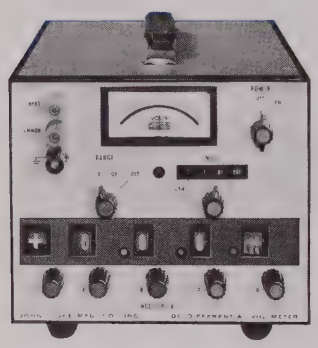
INPUT ISOLATION FROM CHASSIS:
Greater than 5×10^{11} ohms

PRICE:

A88	Isolation Amplifier	$125.00
A88-1	Metal Instrument Case	$ 20.00
A84-2	Mercury Battery Kit	$ 5.00
A84-3	AC Power Pack	$ 25.00
A88-4	Rechargeable Battery Pack with Metal Instrument Case	$100.00

FLUKE

DC Differential Voltmeters



Model 871A

INPUT VOLTAGE:
0 to 1100V DC in four ranges

ACCURACY (% OF INPUT):
±(0.03% +10 uv)

NULL RANGES:
1 mv through 100V full scale in six ranges

INPUT IMPEDANCE:
Infinite at null from 0 to 11V DC
10 megohms above 11V DC

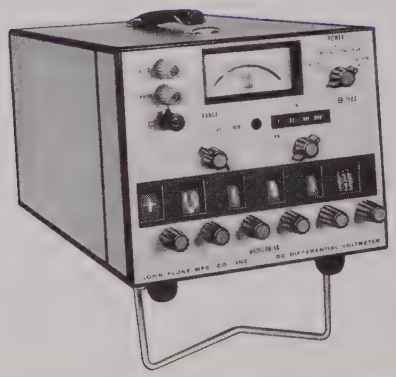
RESOLUTION:
10 uv maximum, vernier and meter

POWER:
Model 871A — 115/230 VAC, 50-440 cps
Model 871AB — As above, plus internal rechargeable battery pack

DIMENSIONS:
7" high x 8½" wide x 11¾" deep

WEIGHT:
Model 871A—Approximately 11½ pounds
Model 871AB—Approximately 12½ pounds

PRICE:
Model 871A — $565.00
Model 871AB — $695.00



Model 881A

INPUT VOLTAGE:
0 to 1100V DC in four ranges

ACCURACY (% OF INPUT):
±(0.01% +5 uv)

NULL RANGES:
100 uv through 100V full scale in seven ranges

INPUT IMPEDANCE:
Infinite at null from 0 to 11V DC
10 megohms above 11V DC

RESOLUTION:
1 uv maximum, vernier and meter

POWER:
Model 881A — 115/230 VAC, 50-440 cps
Model 881AB — As above, plus internal rechargeable battery pack

DIMENSIONS:
7" high x 8½" wide x 14¾" deep

WEIGHT:
Model 881A — Approximately 13 pounds
Model 881AB — Approximately 14 pounds

PRICE:
Model 881A — $825.00
Model 881AB — $955.00

Model 885A

INPUT VOLTAGE:
0 to 1100V DC in four ranges

ACCURACY (% OF INPUT):
±(0.005% +5 uv)

NULL RANGES:
100 uv through 100V full scale in seven ranges

INPUT IMPEDANCE:
Infinite at null from 0 to 11V DC
10 megohms above 11V DC

RESOLUTION:
1 uv maximum, vernier and meter

POWER:
Model 885A — 115/230 VAC, 50-440 cps
Model 885AB — As above, plus internal rechargeable battery pack

DIMENSIONS:
7" high x 8½" wide x 14¾" deep

WEIGHT:
Model 885A — Approximately 13 pounds
Model 885AB — Approximately 14 pounds

PRICE:
Model 885A — $1195.00
Model 885AB — $1325.00

Rack Mounting Configurations

Two Fluke solid-state voltmeters may be rack-mounted side-by-side with the 881A-103 Dual Rack Mounting Kit. This kit includes right and left handles, plus a center key plate, which attach rigidly to the side rails of the instruments for an overall standard EIA rack width and height of 19 inches and 6-31/32 inches respectively. The 881A-102 kit similarly adapts a single voltmeter for rack mounting, and includes handles. Price for 881A-103 Dual Rack Mounting Kit, $15.00; 881A-102 Single Rack Mounting Kit, $25.00.

Infinite Input Resistance at Null from 0 to 500V DC

FLUKE

AC/DC Differential Voltmeters

Model 803B

INPUT VOLTAGE:
0 to 500V AC or DC in four ranges

ACCURACY (% OF INPUT):
DC: ±0.05% from 0.1 to 500V DC
±(0.05% +50 uv) below 0.1V DC
AC: (20 cps to 10 KC)
±0.2% from 0.5 to 500V AC
±(0.2% +25 uv) from 0.001 to 0.5V AC
(10 cps to 20 cps)
±(0.5% +25 uv) from 0.001 to 500V AC
(5 cps to 10 cps)
±(3% +25 uv) from 0.001 to 500V AC

NULL RANGES:
±10, ±1, ±0.1, ±0.01V AC and DC;
±100, ±0.001V AC

INPUT IMPEDANCE:
DC: Infinite at null from 0 to 500V DC
AC: 1 megohm, 35 uuf (500 and 50V AC ranges)
1 megohm, 50 uuf (5 and 0.5V AC ranges)

MAXIMUM METER RESOLUTION:
50 uv DC; 5 uv AC

REFERENCE:
Standard Cell (Zener diode optional)

DIMENSIONS:
Cabinet Model — 9¾" wide x 13" high x 16" deep

WEIGHT:
Cabinet Model — 27½ pounds
Rack Model — 25 pounds

PRICE:
Cabinet Model (803B) — $875.00
Rack Model (803BR) — $895.00
Zener Reference (/AG model suffix) — Add $50.00

Model 803D

INPUT VOLTAGE:
0 to 500V AC or DC in four ranges

ACCURACY (% OF INPUT):
DC: ±0.02% from 0.1 to 500V DC
±(0.02% +25 uv) below 0.1V DC
AC: (30 cps to 5 KC)
±0.1% from 0.5V to 500V AC
±(0.1% +25 uv) from 0.001 to 0.5V AC
(20 cps to 10 KC)
±0.15 from 0.5V to 500V AC
±(0.15% +25 uv) from 0.001 to 0.5V AC
Reduced accuracy at extended frequencies from 5 cps to 100 KC

NULL RANGES:
±10, ±1, ±0.1, ±0.01, ±0.001V AC and DC
±100V AC

INPUT IMPEDANCE:
DC: Infinite at null from 0 to 500V DC
AC: 1 megohm, 35 uuf (500 and 50V AC ranges)
1 megohm, 50 uuf (5 and 0.5V AC ranges)

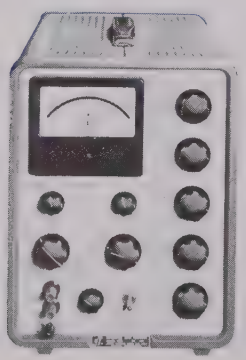
MAXIMUM METER RESOLUTION:
5 microvolts AC and DC

REFERENCE:
Standard Cell (Zener diode optional)

DIMENSIONS:
Cabinet Model—9¾" wide x 13" high x 16" deep

WEIGHT:
Cabinet Model — 28 pounds
Rack Model — 26 pounds

PRICE:
Cabinet Model (803D) — $1055.00
Rack Model (803DR) — $1075.00
Zener Reference (/AG model suffix) — Add $50.00



Model 823A

INPUT VOLTAGE:
0 to 500V AC or DC in four ranges

ACCURACY (% OF INPUT):
DC: ±0.01% from 0.5 to 500V DC
±(0.01% +10 uv) below 0.5V DC
AC: (30 cps to 5 KC)
±0.1% from 0.5V to 500V AC
±(0.1% +25 uv) from 0.001 to 0.5V AC
(20 cps to 10 KC)
±0.15% from 0.5V to 500V AC
(0.15% +25 uv) from 0.001V to 0.5V AC
Reduced accuracy at extended frequencies from 5 cps to 100 KC

NULL RANGES:
±10, ±1, ±0.1, ±0.01, ±0.001V AC and DC
±100V AC

INPUT IMPEDANCE:
DC: Infinite at null from 0 to 500V DC
AC: 1 megohm, 35 uuf (500 and 50V AC ranges)
1 megohm, 50 uuf (5 and 0.5V AC ranges)

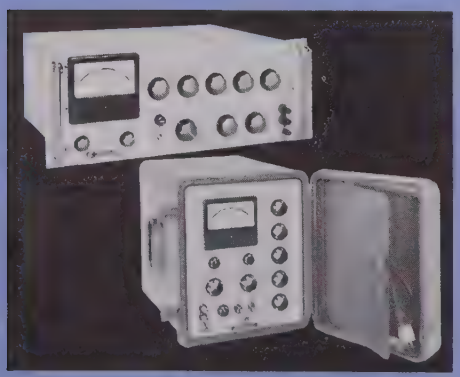
MAXIMUM METER RESOLUTION:
5 microvolts AC and DC

REFERENCE:
Standard Cell (Zener diode optional)

DIMENSIONS:
Cabinet Model — 9¾" wide x 13" high x 16" deep

WEIGHT:
Cabinet Model — 28 pounds
Rack Model — 26 pounds

PRICE:
Cabinet Model (823A) — $1215.00
Rack Model (823AR) — $1235.00
Zener Reference (/AG model suffix) — Add $50.00



1. Rack Models (Model 803BR illustrated)

All Fluke differential voltmeters are available in either cabinet models, or rack mounting models (add "R" to model number). Standard EIA panel dimensions for rack models—6-31/32" x 19". Depth behind panel: DC models—14"; AC/DC models—15½".

2. Transit Cases (Model 801B/AF illustrated)

Where operation and storage in severe relative humidity conditions up to and including 100% are required, all cabinet model Fluke differential voltmeters are available with splash-proofed panel and MIL-T-945A combination case as illustrated.

DC Differential Voltmeters

Model 801B

INPUT VOLTAGE:
0 to 500V in four ranges
ACCURACY (% OF INPUT):
±0.05% from 0.1 to 500V
±(0.05% + 50 uv) below 0.1V
NULL RANGES:
±10, ±1, ±0.1, ±0.01V
INPUT IMPEDANCE:
Infinite at null from 0 to 500V
MAXIMUM METER RESOLUTION:
50 microvolts

REFERENCE:
Standard Cell (Zener diode optional)
DIMENSIONS:
Cabinet Model — 9¾" wide x 13" high x 14" deep
WEIGHT:
Cabinet Model — 24 pounds
Rack Model — 21½ pounds
PRICE:
Cabinet Model (801B) — $485.00
Rack Model (801BR) — $505.00
Zener Reference (/AG model suffix) — Add $50.00

Model 825A

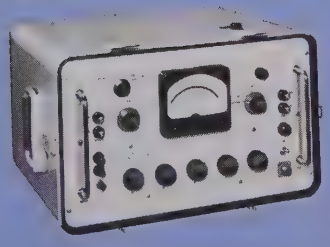
INPUT VOLTAGE:
0 to 500V in four ranges
ACCURACY (% OF INPUT):
±0.02% from 0.1 to 500V
±(0.02% + 25 uv) below 0.1V
NULL RANGES:
±10, ±1, ±0.1, ±0.01, ±0.001V
INPUT IMPEDANCE:
Infinite at null from 0 to 500V
MAXIMUM METER RESOLUTION:
5 microvolts

REFERENCE:
Standard Cell (Zener diode optional)
DIMENSIONS:
Cabinet Model — 9¾" wide x 13" high x 14" deep
WEIGHT:
Cabinet Model — 25 pounds
Rack Model — 22 pounds
PRICE:
Cabinet Model (825A) — $590.00
Rack Model (825AR) — $610.00
Zener Reference (/AG model suffix) — Add $50.00

Model 821A

INPUT VOLTAGE:
0 to 500V in four ranges
ACCURACY (% OF INPUT):
±0.01% from 0.5 to 500V
±(0.01% + 10 uv) below 0.5V
NULL RANGES:
±10, ±1, ±0.1, ±0.01, ±0.001V
INPUT IMPEDANCE:
Infinite at null from 0 to 500V
MAXIMUM METER RESOLUTION:
5 microvolts

REFERENCE:
Standard Cell (Zener diode optional)
DIMENSIONS:
Cabinet Model — 9¾" wide x 13" high x 14" deep
WEIGHT:
Cabinet Model — 25 pounds
Rack Model — 22 pounds
PRICE:
Cabinet Model (821A) — $795.00
Rack Model (821AR) — $815.00
Zener Reference (/AG model suffix) — Add $50.00

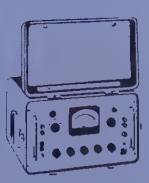


Militarized DC Differential Voltmeter

Model 8011A

Meets all environmental requirements of MIL-T-945A.

The Model 8011A DC Differential Voltmeter, built to MIL-T-945A, provides accurate voltage measurements under adverse environmental conditions. Housed in a light grey military combination case, Model 8011A is designed for continuous operation from −54°C to +65°C with 95% relative humidity up to an altitude of 10,000 feet; for extended storage from −65°C to 85°C with 100% relative humidity up to an altitude of 50,000 feet.

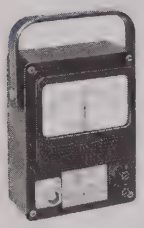


BRIEF SPECIFICATIONS

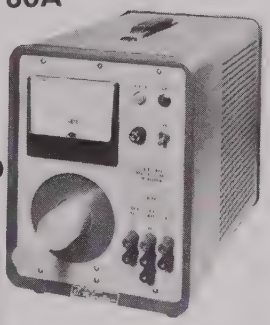
INPUT VOLTAGE RANGE: 0 to 500V
ACCURACY: ±0.05% of input from 0.1 to 500V
±0.1% of input or 50 uv, whichever is greater, below 0.1V
NULL RANGES: ±10, ±1, ±0.1, ±0.01V
INPUT IMPEDANCE: Infinite at null from 0 to 500V
REFERENCE: Temperature controlled Zener diode
DIMENSIONS: Combination case with cover —
19" wide x 11½" high x 19½" long
PRICE: $1,745.00

FLUKE

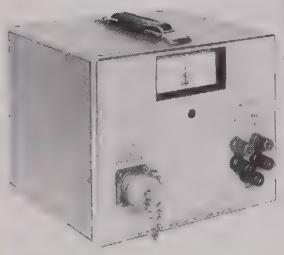
Precision Voltage Dividers



Model 80A



Model 80D



Model 80E

Model 80A Voltage Dividers are designed for use with Fluke vacuum tube differential voltmeters, providing 500V output at maximum input voltage. Models 80D and 80E are tapped for 10V and 1V outputs at rated input, for use with all Fluke differential voltmeters and any conventional potentiometer. Both instruments incorporate special Fluke-manufactured precision wirewound resistors with extremely low temperature coefficients, which maintain the excellent division ratio accuracy for any input voltage up to rated maximum, and over a 10°C temperature range. In one configuration, Model 80E may be bench mounted, rack mounted with solid-state voltmeters, or singly rack mounted. All voltage dividers have zero center panel meters to indicate polarity and magnitude of high voltage input, and draw 1 ma. current at rated input.

MODEL NO.	MAX. INPUT VOLTAGE	TOTAL RESISTANCE	DIVISION RATIO 500V OUT	10V OUT	1V OUT	DIVISION RATIO ACCURACY	PRICE
80A-1	1 KV	1 Meg	2:1	—	—	±0.015%	$ 100.00
80A-2	2 KV	2 Meg	4:1	—	—	±0.015%	$ 110.00
80E-5	5 KV	5 Meg	—	500:1	5,000:1	±0.01%	$ 225.00
80E-10	10 KV	10 Meg	—	1000:1	10,000:1	±0.01%	$ 350.00
80D-30	30 KV*	30 Meg	60:1	3000:1	30,000:1	±0.01%	$1,095.00

*Intermediate voltages between 10 KV and 30 KV available upon request.

Electronic Galvanometers

Model 840A

Model 841A

Fluke all-solid-state Electronic Galvanometers now include Models 840A, 840B, 841A, and 841B. Unique design features fast response, virtual immunity to overload damage, battery or AC operation, complete isolation from chassis, recorder output, operation in any position, and solid mechanical design that withstands MIL-spec shock and vibration. The 840A and 840B may be purchased without case for OEM applications. Form factor and large meter of the 841 series suits these units ideally for bench use.

BRIEF SPECIFICATIONS

FULL SCALE RANGES:

840A and 841A
- ±30 nanoamperes (2 na/scale div.)
- ±300 nanoamperes (20 na/scale div.)
- ±3 microamperes (200 na/scale div.)

840B and 841B
- ±100 nanoamperes (5 na/scale div.)
- ±1 microampere (50 na/scale div.)
- ±10 microamperes (500 na/scale div.)

INPUT RESISTANCE:

840A and 841A—180 ohms

840B and 841B—18 ohms

SIZE:

840A and 840B
5½" high x 3" wide x 4¾" deep without case (case depth is 6½" behind panel including rear terminals)

841 A and 841B
5½" high x 4" wide x 6½" behind panel including rear terminals

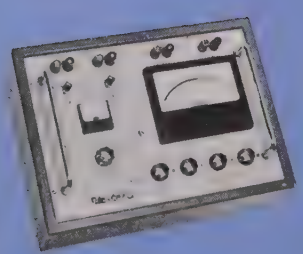
PRICE:

840A and 840B
Less batteries and case $175.00

A84-1	Metal Instrument Case	$ 20.00
A84-2	Mercury Battery Kit	$ 5.00
A84-3	AC Power Pack	$ 25.00
A84-4	Rechargeable Battery Pack and Metal Case	$100.00

841A and 841B
With Mercury Batteries and Case $220.00

Model 831A Microvolt Potentiometer



Use Fluke Model 831A Microvolt Potentiometer to measure thermal EMF, contact potentials, galvanic action, standard cell differences, absolute output of thermocouples and other minute potentials; or as a microvolt source. Used alone, or with Fluke differential voltmeters, the 831A extends high accuracy and infinite input resistance characteristics to the low microvolt region.

BRIEF SPECIFICATIONS

VOLTAGE RANGE:
0.2 uv to 50 mv in 5 ranges

ACCURACY:
- ±(0.75% of full scale + 0.2 uv)
- ±(0.05% of reading + 0.2 uv) with 0.01% Fluke voltmeter as external meter
- ±(0.05% of reading + 0.1 uv) with external meter and null detector

INPUT RESISTANCE:
Infinite at null

POLARITY:
Reversible via front panel switch

POWER:
Mercury batteries

SIZE:
Cabinet Model—14¾" wide x 10¾" high x 5½" deep
Rack Model—19" wide x 7" high x 5½" deep

PRICE:
Cabinet Model—$595.00
Rack Model—$615.00

Postage Will be Paid by Addressee

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY MAIL

FIRST CLASS PERMIT No. 5464—SEATTLE, WASH.

JOHN FLUKE MFG. CO., INC.

P. O. BOX 7428

SEATTLE 33, WASHINGTON

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MODEL	PRODUCT	I HAVE NEED AND WOULD LIKE DELIVERY & PRICE
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3.		PLEASE HAVE YOUR REP. CALL
4.		☐
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NAME _____

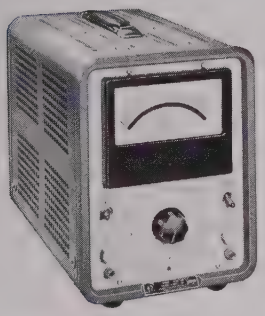
POSITION _____

FIRM _____

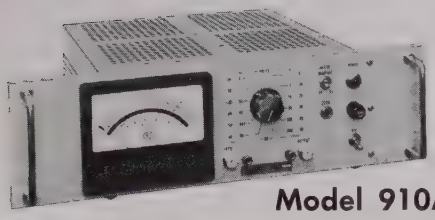
ADDRESS _____

CITY _____ ZONE _____ STATE _____

Model 910A True RMS Voltmeter



Model 910A



Model 910AR

The Model 910A true RMS Voltmeter combines true RMS response with 1% accuracy over a broad frequency range. Its true RMS response, by definition, guarantees that the accuracy of the indicated reading is maintained regardless of input waveform characteristics. The 910A is ideal for measuring noise, ripple, and microphonics; harmonic and intermodulation distortion; transformer and magnetic amplifier losses; audio and video power; frequency response.

BRIEF SPECIFICATIONS

VOLTAGE RANGE:
100 uv to 300 V in twelve ranges

DECIBEL RANGE:
−72 to +52 dbm in twelve ranges

FREQUENCY RESPONSE:
10 cps to 7 MC

ACCURACY:
±1% of full scale 50 cps to 800 KC
±2% of full scale 20 cps to 2 MC
±3% of full scale 20 cps to 3.5 MC
±5% of full scale 10 cps to 7.0 MC

INPUT IMPEDANCE:
10 megohms shunted by 30 uuf on ranges from 0.001V to 0.30V
10 megohms shunted by 15 uuf on ranges from 1.0 to 300V

CREST FACTOR:
Three at full scale. Nine at range switchover point

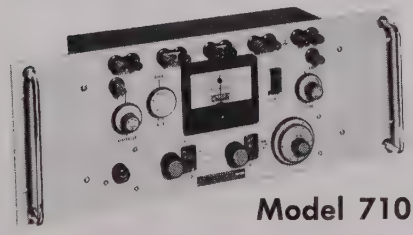
AMPLIFIER:
Output terminals provide approximately 100 mv RMS at full scale regardless of range

DIMENSIONS:
Cabinet Model — 7¼" wide x 10½" high x 15" deep
Rack Model — 19" wide x 5¼" high x 13¾" deep

PRICE:
Cabinet Model — $525.00
Rack Model — $545.00

Universal Impedance Bridge

Model 710B



Model 710BR

Model 710B is designed to allow simple and rapid selection of any one of five different bridge configurations for measurement of AC and DC resistance, capacitance, inductance, dissipation factor (D), and storage factor (Q). Bridge arm resistors and capacitance standard are Fluke-manufactured for high accuracy and low temperature coefficient. The 710B is also capable of many specialized measurements such as remote capacitance, incremental inductance, biased electrolytics, and tuned circuit resonant frequencies.

RESISTANCE:
Range: 0.1 milliohm to 12 megohms in 8 ranges
Accuracy: ±0.1% + 1 dial div. + 0.001 ohm

CAPACITANCE:
Range: 0.1 picofarad to 1200 microfarads in 7 ranges
Accuracy (six ranges): ±(0.2 + 0.5 Df + 0.05 f)% + 1 dial div.
Accuracy (lowest range): ±(0.2 + 4 Df + 0.05 f)% + 1 dial div.
NOTE: f in kilocycles, D of sample.

INDUCTANCE:
Range: 0.1 microhenry to 1200 henrys in 7 ranges
Accuracy (six ranges): $\pm\left(0.3+\frac{0.5f}{Q}\right.$ $\left.+0.05\ f\right)\% + 1$ dial div.
Accuracy (highest range): $\pm\left(0.3+\frac{4f}{Q}\right.$ $\left.+0.05\ f\right)\% + 1$ dial div.
NOTE: f in kilocycles, Q of sample.

FREQUENCY RANGE:
DC to 20 KC (1 KC Quick-Change networks supplied as standard equipment)

INPUT POWER:
115/230 VAC ±10%, 50-440 cps, 12 watts

DIMENSIONS:
Cabinet Model — 13" long x 9½" wide x 6" high
Rack Model — 7" high x 19" wide x 4" behind panel

WEIGHT:
Cabinet Model — 11¾ pounds
Rack Model — 10 pounds

PRICE:
Cabinet Model — $485.00
Rack Model — $505.00

OPTIONAL ACCESSORIES:
Quick-Change RC generator and detector networks for the following frequencies: 100 cps, 120 cps, 400 cps, 500 cps, 800 cps, 2 KC, 5 KC, 10 KC, and 20 KC. Price $40.00 (100 cps-400 cps); $30.00 (500 cps-20 KC).

Model 102 VAW Meter

The Model 102 VAW Meter measures voltage, current, and power over a wide frequency range. It has a maximum true power sensitivity of 225 microwatts and will measure up to 18 kilowatts over the frequency range of 20 cps to 100 KC. The 102 is designed to measure true power consumed by a wide variety of loads including both linear and non-linear elements, with negligible insertion loss on the circuit under test.

BRIEF SPECIFICATIONS

VOLTAGE FULL SCALE:
1.5-600V

CURRENT FULL SCALE:
1.5 ma-30 amps

POWER:
225 uw to 18 kw with 14 shunts

PRICE:
Cabinet Model — $660.00
Rack Model — $680.00
Shunts — $30.00 each

POWER FACTOR RANGE	FREQUENCY RESPONSE	ACCURACY	INPUT IMPEDANCE
1.0	20 cps-40 KC	3%	1 megohm 25 uufd
1.0	40 KC-100 KC	10%	
0.1	20 cps-20 KC	3%	
0.1	20 KC-40 KC	10%	

FLUKE

Model 540B Thermal Transfer Standard

For ±0.01% RMS AC transfer measurements without calibration curves or correction tables, Fluke offers the new all-solid-state Model 540B AC/DC Thermal Transfer Standard. Thermocouple burnout is virtually eliminated by a unique protection circuit. In addition, a search circuit provides visual indication of the percent of rated input. DC input to the unit is conveniently reversed via front panel switch, and DC turnover is held to less than 0.01% of input. Self-contained galvo is Fluke Model 840B solid-state electronic type. One configuration of Model 540B is used for both bench and rack mounting. Accessories include A40 Current Shunts for thermal AC/DC current transfers and A55 Thermal Converters for extension of frequency response to 50 MC.

BRIEF SPECIFICATIONS

VOLTAGE RANGE:
0.25 to 1000V in 14 ranges

ACCURACY (% OF INPUT)

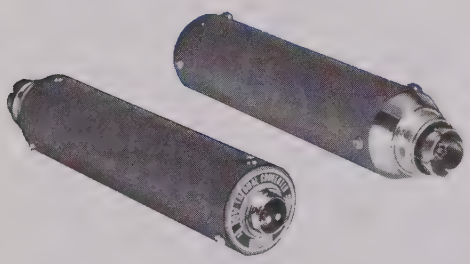
Range	Frequency	AC/DC Difference
All except 1000V	5 cps-50 KC	±0.01%
1000V	5 cps-20 KC	±0.02%
1000V	20 KC-50 KC	±0.05%
0.5 thru 10V	50 KC- 1 MC	±0.1%

GALVANOMETER RESOLUTION:
0.0012%/scale div. at rated input

DIMENSIONS:
Cabinet—7" high x 17" wide x 7¾" deep
Rack—7" high x 19" wide x 7¾" deep

PRICE:
$895.00 (Rack mounting kit, $15.00)

Model A55 Thermal Converters



Coaxial Model A55 Thermal Converters are standards with frequency response, thermal characteristics, and stability essentially identical to NBS theoretical standards. An equipment setup for AC calibration or measurement utilizing a Model A55 would typically include Model 540B and A55-110 Accessory Kit described below.

BRIEF SPECIFICATIONS

RANGE:
Nine converters rated 0.5, 1, 2, 3, 5, 10, 20, 30 and 50 volts, each useful from ½ to 1 times rating.

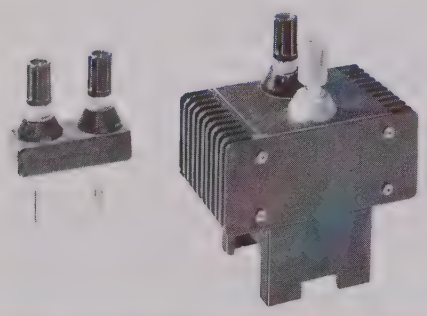
AC/DC DIFFERENCE:

Converter	5 cps-1 MC	10 MC	30 MC	50 MC
0.5V*	±0.01%	+0.10%	+0.50%	+1.5%
1V-10V	±0.01%	±0.03%	±0.10%	±0.10%
20V-50V	±0.01%	±0.05%	±0.10%	–

*0.5V converter supplied with Fluke ±0.01% test report at 10, 30, and 50 MC. Fluke or NBS test report for any converter optional at extra cost.

PRICE: 0.5V, $100.00; 1V, 2V, 3V, 5V, (each) $125.00; 10V, 10V, 20V, 30V, 50V, (each) $150.00

Model A40 Current Shunts



Model A40 Current Shunts are designed to convert the Model 540B to an RMS current transfer instrument useful over a 2.5 milliampere to 10 ampere range, with a frequency response from 5 cps to 100 KC. Fluke or NBS test reports may be obtained which give correction figures to ±0.02%. Without correction figures, accuracy is as specified below:

CURRENT RANGES:
2.5 ma to 10 amps RMS with 13 shunts

ACCURACY (% OF INPUT)

Range	Frequency	AC/DC Difference
2.5 ma to 5 amps	5 cps- 20 KC	±0.03%
	20 KC- 50 KC	±0.05%
	50 KC-100 KC	±0.10%
5 amps to 10 amps	5 cps- 20 KC	±0.03%
	20 KC- 50 KC	±0.10%

PRICE (Shunts are listed according to nominal rating):
10, 20, 30 ma . . . . . $30.00 each
50, 100, 200, 300, 500 ma . . . . $60.00 each
1, 2, 3, 5, 10 amps . . . . . $75.00 each

Accessory Kit A55-110

Model A55-110 Accessory Kit includes three adapters, interconnecting cable, and coaxial tee for use between an AC source and Model A55 Thermal Converters. Price $75.00.

Model C40 and C55 Storage Cases

Model C40 Royalite Case with molded insert conveniently stores a complete set of A40 Current Shunts. Model C55 Case similarly protects a set of A55 Thermal Converters and A55-110 Accessory Kit. Each case is $55.00, or no charge with complete sets of shunts or converters.

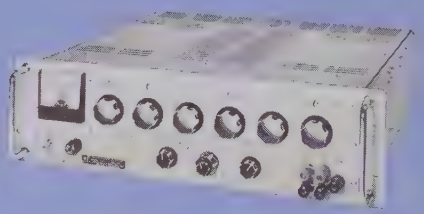
FLUKE

Solid-State Calibrators

Fluke all-solid-state calibrators include Model 313A Voltage Calibrator, Model 382A Voltage/Current Calibrator, and Model 383B Voltage/Current Calibrator with remote programming for systems applications. In all models, voltage range is 0 to 50V DC, and 0 to 2 amperes, with 5 part-per-million line and load regulation. All use Fluke specially selected and processed zener reference in a temperature-controlled oven to assure excellent calibration accuracy and stability. Only Fluke-manufactured precision wirewound resistors are used in the decade sample strings. Continuously variable current and current/voltage limiting maintain precise control of the output, preventing damage to the instrument and load. Mechanical design utilizes convenient plug-in flow-soldered glass-epoxy printed circuit boards. These instruments have included severe environmental tests as design parameters.

Model 383B has its voltage/current modes, current ranges, and voltage/current outputs programmed via parallel multi-bit binary coded decimal input signals using a 1-2-4-4 code in standard configuration. Other codes are available at extra cost. Voltage/current output programming is accomplished by actuation of mercury-wetted reed relays across resistors in the sample string.

Model 313A



Model 382A

Model 383B

MODEL	VOLTAGE	CURRENT	REGULATION LINE	REGULATION LOAD	STABILITY, % HOUR	STABILITY, % DAY	STABILITY, % PER MO.	CALIBRATION ACCURACY	MAX. RIPPLE RMS	RESOLUTION	PRICE
313A	0-50V	0-2A	0.0005	0.0005	0.002	0.0025	0.005	0.01%	50 uv	10 uv	$1295.00
382A (VOLTAGE MODE)	0-50V	0-2A	0.0005	0.0005	0.002	0.0025	0.005	0.01%	50 uv	10 uv	$1595.00
382A (CURRENT MODE)	0-50V	0-2A (four ranges)	0.0005	0.001	0.0025	0.005	0.005	0.02%	0.002% of range	10 na	
383B (VOLTAGE MODE)	0-50V	0-2A	0.0005	0.0005	0.005	0.005	0.01	0.025%	50 uv	100 uv	$1950.00
383B (CURRENT MODE)	0-50V	0-2A (four ranges)	0.001	0.001	0.005	0.005	0.01	0.025%	0.005% of range	10 na	

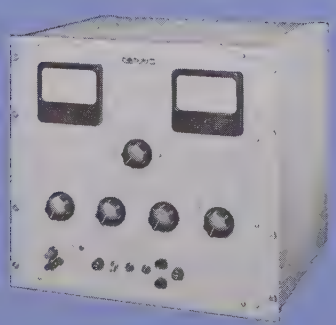
Precision Voltage Calibrators

Fluke Models 301C, 301E, and 334B Precision Voltage Calibrators offer a remarkable degree of all-around usefulness. Conservative parameters of accuracy, stability, regulation, resolution and ripple are combined with exceptionally high current capabilities in all instruments. Chopper stabilization and standard cell reference are common features. These supplies are particularly well suited to applications demanding ruggedness and time-proven reliability.

MODEL	VOLTAGE	CURRENT (ma)	REGULATION LINE (%)	REGULATION LOAD (%)	STABILITY, % HOUR	STABILITY, % DAY	STABILITY, % PER MO.	CALIBRATION ACCURACY	MAX. RIPPLE RMS	RESOLUTION	PRICE
301E	1.02-512 v	0-300	0.005	0.01	0.005	0.01	0.01	0.1%	2 mv	500 uv	$ 695.00
301C	1.02-1012 v	0-400	0.005	0.01	0.005	0.01	0.01	0.1%	2 mv	500 uv	985.00
334B	0-3111 v	0-400	0.002	0.005	0.005	0.01	0.01	0.03%	1 mv	50 uv	2,650.00

Model 301E

Model 301C



Model 334B

High Voltage Power Supplies

0 to 30,000V DC

In more than 5,000 installations where quality is essential, Fluke power supplies are on the job, providing unexcelled performance and reliability through electrical and mechanical excellence of design. With the addition of the 430 series, the Fluke spectrum is now 0 to 30,000V DC. Every specification parameter is conservative; customers have found this to be true without exception, and show their confidence by specifying Fluke when their voltage demands increase.

Certain applications demand high calibration accuracy, while others require high stability and a low ripple component. Excellent line and load regulation are always a must. Across the specification board, Fluke high voltage supplies meet or beat virtually all system requirements.

Volume-production techniques and maintenance of a large stock keep Fluke supplies attractively priced.

Following are typical types of equipment which demand power supply specifications best met by Fluke instruments:

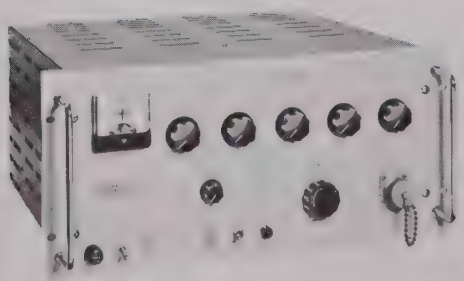
PHOTOMULTIPLIER TUBES
IONIZATION CHAMBERS
TRAVELING-WAVE TUBES
PROPORTIONAL COUNTERS
KLYSTRONS
MASS SPECTROMETERS
CATHODE-RAY TUBES
BACKWARD-WAVE OSCILLATORS
HIGH-RESOLUTION X-RAY EQUIPMENT
ELECTROSTATIC EQUIPMENT
LASERS
MASERS

More general applications include voltmeter and voltage divider calibration, high voltage research, and component evaluation and test.

Four entirely new Fluke power supplies are introduced for the first time in this catalog. All offer advanced performance as their value feature. Each is a specialized type of instrument to which Fluke has applied many years of research, engineering and production experience.

Model 409A

Model 410B



Model 412B

Model 413C

Model 405B

Model 430A

Detailed specifications are available for all models of Fluke power supplies, including data on environmental capabilities. A comprehensive manual supplied with each instrument details operating, calibration and service procedures.

MODEL	VOLTAGE	CURRENT (ma)	REGULATION (%) LINE	REGULATION (%) LOAD	STABILITY (%) PER HR.	STABILITY (%) PER DAY	CALIBRATION ACCURACY (% of Output)	MAX. RIPPLE RMS	RESOLUTION	PRICE
409A	170-1530V	0-3	0.01	1.2	0.005	0.02	—	0.002%	85V steps	$ 350.00
412B*	0-2100V	0-30	0.001	0.001	0.005	0.02	0.25	500 uv	5 mv	410.00
413C	0-3111V	0-20	0.001	0.001	0.005	0.03	0.25	150 uv	2 mv	695.00
413D	→ Same as 413C, less panel meters, polarity plug instead of switch ←									595.00
405B*	0-3100V	0-30	0.001	0.001	0.005	0.03	0.25	1 mv	5 mv	525.00
408B*	0-6000V	0-20	0.001	0.001	0.005	0.02	0.25	1 mv	5 mv	665.00
410B*	0-10, 000V	0-10	0.0025	0.0025	0.005	0.02	0.25	1 mv	5 mv	975.00
430A	10KV-30.22KV	0-10	0.005	0.01	0.005	0.03	0.25	5 mv	100 mv	3,900.00
430B*	10KV-30.22KV	0-50	0.005	0.02	0.005	0.03	0.25	5 mv	100 mv	4,900.00

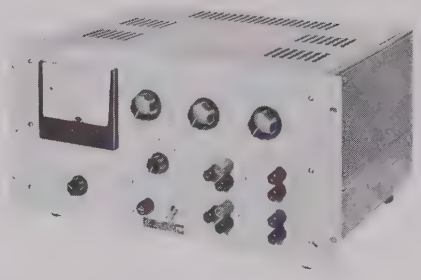
*Incorporates overcurrent protection circuit.

Model 430B

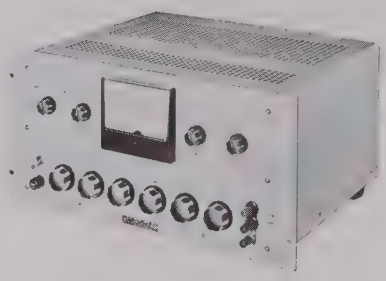
Model 413D

Model 408B

Model 407D



Model 407DR



Model 351A

General Purpose Power Supply

No Fluke power supply has enjoyed more widespread acceptance than the general purpose Model 407D. Laboratories large and small, technical schools, universities, plant production lines and receiving inspection stations, industrial processing facilities—there is no limit to the Model 407D's applications. Undoubtedly a major factor in this success is straightforward and conservative electrical design combined with excellent overall specifications and unmatched ruggedness.

Features include 0.01% short term stability, 2 mv resolution, precision sampling string, dual bias and filament outputs, tight line and load regulation, and low ripple. For convenience and safety, the main DC output may be removed or applied instantly without disturbing bias or filament outputs. Rack version of this supply is available as Model 407DR.

BRIEF SPECIFICATIONS

VOLTAGE:
0-555 v

CURRENT:
0-300 ma

REGULATION:
Line—0.005%
Load—0.01%

STABILITY:
Per hour—0.01%
Per day—0.05%

CALIBRATION ACCURACY:
0.5%

MAX. RIPPLE RMS:
500 uv

RESOLUTION:
2 mv

PRICE:
Cabinet Model (407D)—$360.00
Rack Model (407DR)—$380.00

Constant Current Supply

Model 351A Constant Current Power Supply is standard cell referenced and chopper-stabilized, obtaining ±0.05% accuracy and ±0.005% short term stability. Resolution is an outstanding 0.1 microampere via six in-line decades which read directly in milliamperes. A voltage limiting circuit provides maximum protection when used to calibrate meters. With the limiter in, the output voltage will not rise above 600 millivolts. With the limiter out, the instrument automatically is placed in standby condition if the output voltage attempts to rise above 120 volts. Highest quality components are used to ensure trouble-free operation.

Routine applications include calibration and testing of microammeters and milliammeters, semiconductor devices, torque motors, bolometers, and sensitive DC relays.

BRIEF SPECIFICATIONS

VOLTAGE:
0-100 v

CURRENT:
1 ua-100 ma

REGULATION:
Line—0.01%
Load—0.01%

STABILITY:
Per hour—0.005%
Per day—0.01%

CALIBRATION ACCURACY:
0.05%

MAX. RIPPLE RMS:
0.05%

RESOLUTION:
0.1 ua

PRICE:
$845.00

New Fluke bobbin-type precision wirewound resistors are wound virtually stress-free, with adjacent sections reversed for low-inductance characteristic. Wire illustrated is less than 1 mil in diameter.

Fluke production machinery includes this precision surface grinder, capable of surface finishes to 4 microinches RMS, flatness to better than 0.0002 inch.

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Contact your nearest Fluke representative for detailed specifications for any item, or use the enclosed postage-free card addressed to the factory.

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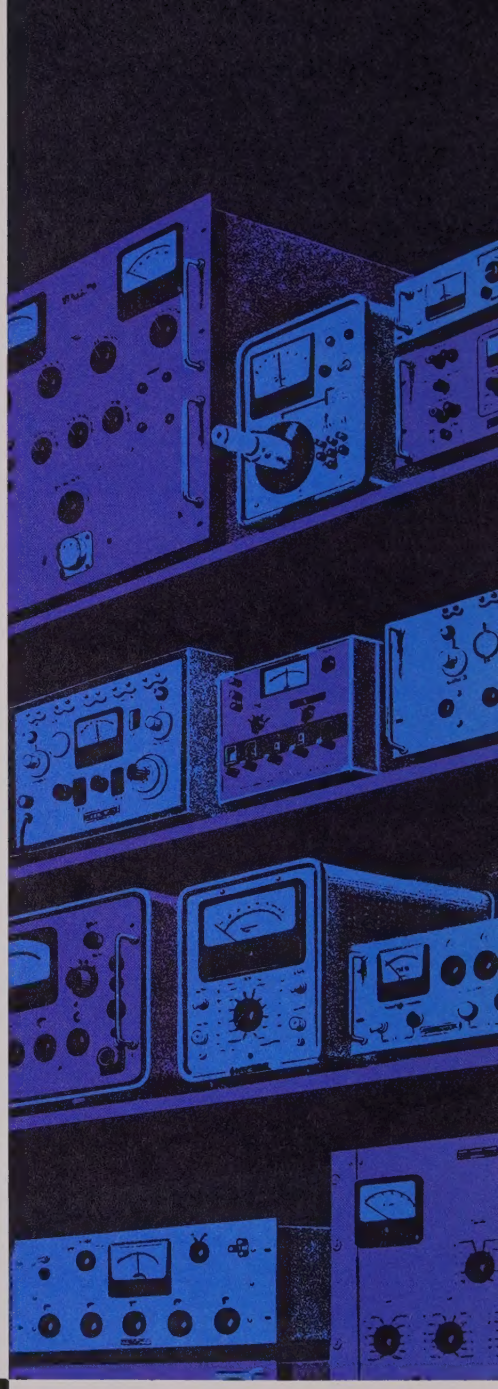
POTENTIOMETER AND RHEOSTATS

The extensive experience of Fluke in the manufacture of resistive devices is evident in that part of the product line devoted to decade potentiometers and rheostats, and vernier potentiometers and rheostats. These components offer better linearity, higher resistance accuracy, and lower temperature coefficient of resistance than any competitive units. Ease and speed of adjustment, no-drift stability, extremely low leakage, and compact size are but a few of the "plus" features available in this unique equipment of the Fluke line. Use the enclosed card to obtain detailed data.

STANDARD FREQUENCY EQUIPMENT

Montronics, Inc., a subsidiary of John Fluke Mfg. Co., manufactures precision solid-state equipment for the reception, generation, comparison, and distribution of standard frequency signals. Product line includes: VLF Receivers, for calibration of local frequency standards; Frequency Synthesizers, for converting a standard frequency signal into many thousands or millions of different precise frequencies; Standard Frequency Comparators, for comparing frequency standards, with resolution as great as 1 part in 10^{11}; and, Standard Frequency Distribution Ampliers, for distributing standard frequency signals throughout a laboratory or manufacturing facility. Contact your nearest Fluke sales representative for technical data or demonstration, or write Montronics, Inc., Box 345, Bozeman, Montana. Telephone (406) 587-4271, TWX (406) 586-9510.

MONTRONICS INC.
BOZEMAN, MONTANA
SUBSIDIARY OF JOHN FLUKE MFG. CO. INC.



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FLUKE

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